

Layer Transfer of Low Defect SiGe Using an Etch-back Process

ABSTRACT OF THE INVENTION

5 A method for forming strained Si or SiGe on relaxed SiGe on insulator (SGOI) or a SiGe
on Si heterostructure is described incorporating growing epitaxial $\text{Si}_{1-y}\text{Ge}_y$ layers on a
semiconductor substrate, smoothing surfaces by Chemo-Mechanical Polishing, bonding two
substrates together via thermal treatments and transferring the SiGe layer from one substrate to
the other via highly selective etching using SiGe itself as the etch-stop. The transferred SiGe layer
may have its upper surface smoothed by CMP for epitaxial deposition of relaxed $\text{Si}_{1-y}\text{Ge}_y$, and
10 strained $\text{Si}_{1-y}\text{Ge}_y$ depending upon composition, strained Si, strained SiC, strained Ge, strained
GeC, and strained $\text{Si}_{1-y}\text{Ge}_y\text{C}$ or a heavily doped layer to make electrical contacts for the SiGe/Si
heterojunction diodes.